



Health Information Technology OIT Architecture Strategy

Enabling Technology Solutions Efficiently, Effectively, and Elegantly



[Table of Contents](#)

[Executive Summary](#)

[Current State](#)

[Applications](#)

[Communication Standards](#)

[Transport](#)

[Security/Privacy](#)

[Devices](#)

[Future State - Initiatives](#)

[Colorado State Health Agencies](#)

[Telemedicine](#)

[Colorado Citizen Engagement Platform as a Service \(CEPaaS\) for Health](#)

Executive Summary

The vision and goals of health information technology architecture are to improve healthcare quality, increase patient safety, reduce costs, and improve public health through the accelerated and effective use of Health Information Technology (HIT). HIT consists of an enormously diverse set of technologies for transmitting and managing health information for consumers, providers, payers, insurers, and other groups with an interest in health and healthcare. In general, it includes the capture, storage, use and/or transmission of health information through electronic processes.

HIT enables communication between providers, allows real time access to data, reduces medical errors, facilitates quality improvement, allows the translation of data into information, and identifies opportunities to improve clinical care through the use of analytics. Although numerous standards for interoperability and terminologies have been developed, integration of information across provider networks, programs, and systems has proven difficult. Colorado believes HIT implementations are not an end in itself, but rather a means to transform the state's health system. To be successful, transformation processes must align incremental needs, priorities, and circumstances of Colorado stakeholders with statewide goals for improving health and healthcare.

Current State

With healthcare costs and quality assurance taking central roles in health reform, attention is directed towards the potential of HIT to lower health care spending and improve efficiency, quality, and safety of health care delivery. Although a host of private and public organizations have prioritized the expansion of HIT, the best models and implementation strategy are still being debated. There are a number of barriers to implementing health information technology solutions which include the cost (equipment, training, etc.), cultural changes, resistance to change from employees, process changes, and complying with HIPAA and other regulatory requirements for private and secure data transmission.

HIT comprises many different components, including:

1. *Applications*

The "programs" used to perform HIT functions. These applications include but are not limited to:

- Patient Registries
- Accounting/Practice Management Systems (PMS)
- CPOE/CDS (Computerized Physician Order Entry with Clinical Decision Support)
- ePrescribing
- Electronic Medical Records (EMRs)
- Electronic Health Records (EHRs)
- Patient Health Records (PHRs)
- Results Reporting
- Electronic Documentation
- Appointment Scheduling
- Patient Kiosks
- Telemedicine and Interface Engines

2. **Communication Standards**

These are the various sets of technology standards that are necessary in order for HIT systems to communicate with each other in a uniform manner. These standards encompass:

- Messaging Standards

- HL7 v2x, HL7 v3.0, NCPDP, X12, DICOM, IEEE, ASTM, EDIFACT, etc.

Messaging standards are the form and structure that is required for the information to move and be tracked from one system to another.

- Terminology Standards

- LOINC, ICD-10, CPT, NDC, RxNorm, Snomed CT, etc.

Terminology standards are the form and structure of the procedure, diagnostic, and clinical codes that are necessary to communicate what procedure was performed, medications prescribed, diagnoses assessed, etc., for a particular patient during a visit.

- Content Standards

- CCR, Clinical Document Architecture (HL7 CDA), Integrating the Healthcare Enterprise (IHE), etc.

Content standards specify the structure and semantics of 'clinical documents' for the purpose of exchange.

3. **Transport**

This includes structured transmission of data between organizations by electronic means. These are the actual steps necessary to obtain, retrieve, send, and receive data and documents from one computer to another, from one system to another and from many systems in an integrated fashion. Some transport examples include SMTP-Direct Based Exchange and SOAP/REST-Secure Web Services.

4. **Security/Privacy**

This plays an important role in all exchange of health information using HIT. Most healthcare providers, institutions and vendors must comply with HIPAA privacy and security requirements in any and all exchange of personal health information (PHI). X.509 Digital Certificates and SAML are two examples.

5. **Devices**

These are the various hardware components that make HIT work and include such things as: Desktops, Laptops, Servers, Tablets, and other mobile devices. As HIT continues to

develop, information is captured and exchanged in new and innovative ways. Some examples of newly developed telemedicine devices include in-home blood pressure monitors, electronic scopes for remotely diagnosing skin ailments, and electrocardiogram (ECG) cases for iPhones.

Future State - Initiatives

All health initiatives will deliver leadership, consultation, knowledge and advice on health informatics and health policy related to options, adoption, effective use and exchange of health information technology. In order to make progress toward this common vision, the State must address immediate priority initiatives and begin building the foundation needed to achieve the desired future of improved information ability and interoperability, reduced cost and redundancy, increased information agility and security, and leveraged infrastructure investments to support transformation of the state's health system.

These first initiatives will consist of the following:

1. *Colorado State Health Agencies*

Problem / Opportunity: Many programs and initiatives across Colorado State agencies require and have a significant impact on HIT development, adoption, and sustainability. However, efforts across agencies and partner organizations are not coordinated to ensure each program and investment is working to build meaningful pieces of the overall strategic vision for HIT in Colorado.

Solution: Foster greater alignment to maximize federal and state investments in health information technology and infrastructure, including coordination with leadership from the Department of Human Services (CDHS), Department of Public Health and Environment (CDPHE), and the Department of Health Care Policy and Financing (HCPF).

Examples of current initiatives for health information technology:

- Assess current integration points and existing interoperability interfaces between health and human services programs and systems (multi-agency collaborative efforts led by CDHS and OIT);
- Identify opportunities to enhance existing interfaces and establish new integration points between priority health and human services systems (multi-agency collaborative efforts led by CDHS and OIT);
- Expand tools and functionality to enhance data analysis and reporting to improve administrative efficiency and assess program quality (CDHS);
- Implement data sharing agreements between health related departments (CDHS, CDPHE, and HCPF); and
- Assess and proactively research advanced analytics solutions to reduce fraud, waste, and abuse in Colorado State health agencies.

2. *Telemedicine*

Problem / Opportunity: Cost and program sustainability have been a long-standing issue in telemedicine. Advocates for the development of telemedicine are faced with the challenges of infrastructure related costs, incompatible software and devices, as well as a lack of well agreed upon protocols, guidelines, and business strategies.

Solution: Provide a security framework to provide telemedicine consultations over the Internet. The recent expansion in the telemedicine market, falling costs in the development of new technology, and the convergence of telemedicine and other HIT applications, provides new opportunities to create technical standards. Increased access to specialty care is a proven benefit of telemedicine, and has been shown to provide services on a sustainable basis to correctional facilities.

Example of current initiatives for telemedicine:

- Identify opportunities to expand out telemedicine capabilities at the Colorado Department of Corrections.

3. *Colorado Citizen Engagement Platform as a Service (CEPaaS) for Health*

Problem / Opportunity: The public sector has lacked proactive outreach and innovation around citizens, the customers of government. Citizen lifecycle management remains passive, reactive and single transaction oriented. Governments could maintain the status quo of siloed and duplicative solutions, but costs will continue to skyrocket due to duplication of data, infrastructure, maintenance, and product support. Citizens will not get the benefit of an enterprise solution, continuous innovation, and proactive services. Governmental decisions will continue to be slow, cumbersome, and lacking proper analytics.

Solution: Deliver a common CRM solution specifically built for governments to provide holistic, comprehensive customer management services. The citizen-centric view allows the citizen to interact with government, and their community, in a seamless and choice-based manner. An important component of this enterprise solution will facilitate access to governmental health services.

Example of CEPaaS for Health:

- Identify opportunities to expand health related services to the citizen, such as My Health, and Medicaid enrollment services.

